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Dr Leonard Goodwin CMG FRS in interview with Dr Max Blythe
Oxford, 16 July 1996, Interview II

MB Dr Goodwin, you were born in Wood Green?

LG Wood Green, London, yes.

MB In July, 1915?

LG July, 1915.

MB Tell me about your parents, the family into which you were born.

LG Well, my father was the manager of a Freeman, Hardy and Willis shoe shop in Wood Green. My mother came from somewhere in the Midlands, in Rutland. And my mother's father was a gamekeeper in Hambleton, in Rutland, to a lady called Mrs Cooper. And he was really quite a stimulus to me, because I used to go up there in my holidays and spend my life with him in the country, enjoying the sights and sounds of the country, and all his interesting things he used to do, because he could mend anything, and make everything, and I learnt quite a lot from him: how to dig holes and plant things, and all that kind of thing.

MB In a way, you became a countryman from knee high to a grasshopper!

LG More or less, yes. And also, I was there during the war, because my father was in the army, and my mother took me to Hambleton, in Rutland, and we stayed there while he was away, you see. So I really started life there.

MB So that was your first kind of unusual setting, but that was your first real family life.

LG That's right, yes.

MB Tell me a little more about your father. Was he a big influence in your early years?

LG Oh yes, he was a very, very steadfast sort of chap, and he was a sidesman in Hampstead Parish Church, and deputy churchwarden for a time, and, you know, he was a sort of generally good man.

MB You got close to him, and he taught you things? He was also a tutor of a form?

LG No, not really, no. He was a good father, I think that's all you can say about him.

MB He was very supportive of you?

LG Yes.

MB What about Mother?

LG Oh well, she just looked after me. I think she was, perhaps, too much of an influence, perhaps. I don't know.

MB What kind of an influence?

LG Oh, I don't know, she sort of kept me rather close to home most of the time.

MB So you were a home-loving boy?

LG More or less, yes.

MB What of hobbies and interests at that time? Did you…

LG Oh, I was, I was interested in all kinds of things. I used to make fireworks and that kind of thing. We lived in Hampstead in those days and I had the whole of the Hampstead Heath to run over. You can't do it now, but in those days, I used to go out at all times. And I was a member of the Scouts, and looked after a Wolf Cub pack and so on. So, you know, camping and country pursuits continued.

MB So, fairly early on, you were a kind of an adventurer, naturalist/scientist?

LG I played with it, put it that way. They bought me… my father bought me *The Science of Life,* Julian Huxley, H G and G P Well's book, when it came out in parts, and that interested me in the… in that…

MB And you collected those and put them on the shelves?

LG Yes. I still have them, yes.

MB In those early years, I mean, you obviously began to build up interests, and to be quite lively. What of the schools you went to, did they make a big impact early on? I know the family, obviously, had.

LG Well, I went to William Ellis School, a secondary school which is in Gospel Oak, down towards Camden Town. I used to walk to school every day, and back. And that was a good school. In those days, it was right next to the railway – the main line from St Pancras went past the playground. But there were some good teachers there.

MB Are there any that particularly stand out that you want to put on the record?

LG Oh, I don't know.

MB That's putting you on the spot then.

LG Well, I can remember their names. The science teacher was a chap called Martin, we used to call him 'Ernie', he taught chemistry. He was a great big fellow. And the physics one was a chap called Neville, and he was a cripple – a little man with two sticks, and he was, you know, a real… shall we say, an inspiration as to how you could get on when you were very, very deformed and at a great disadvantage. I enjoyed him very much.

MB What kind of a boy was growing up at that time, Len? Did you make lots of friends?

LG Oh, plenty, yes, because of the Scouts and this kind of thing, you see.

MB So, many friendships.

LG Yes.

MB School goes well. Did you stack up well at school? I mean, were your performances good? Did you realise that you were going to have a fairly sound career?

LG Well, I really didn't take too much notice of it, but at the end… it was a school in which they did no biology, actually, which is why I was particularly interested in these books which my father bought me, you see. We did chemistry, physics, maths and English for our… our matric it would be then, in 1930. In 1932, I did what was then inter BSc, but I had, at that time, no biology at all. But they gave me a senior county scholarship. I'd done this on a junior… LCC [London County Council] county scholarships at school, secondary school.

MB Len, before we move to that course, and that inter BSc kind of stage, I just want to keep to the kind of development of scientific interest, because somewhere in that secondary school phase, you decided that you might go towards pharmacy.

LG Yes, well…

MB How did that arise?

LG That was my Uncle Percy, who was… Percy Daniel, my father's brother, he was a pharmacist, and he was manager of John Bell and Croyden's Pharmacy in Wigmore Street. And he saw that I was messing about with chemical things and making fireworks and so on, and he said, 'If he's interested in chemistry, he ought to be a pharmacist,' you see. So that really started it off.

MB That really was the beginning of it all.

LG Yes.

MB His kind of suggestion.

LG Yes, yes.

MB But he must have been an important uncle to have had that impact.

LG Well, yes, he was a fairly good standby, you know. If we were not very well, we used to go to Uncle Percy first, usually, for advice. And he was also next door to Henry Wellcome's museum, which he established in… well, in Wigmore Street, in those days.

MB And I think you said that he knew Henry Wellcome.

LG He knew him, yes, because he was sort of next door.

MB And that will kind of lead us into a later part of our story.

LG Yes. Yes.

MB But, for now, we're taking you to study pharmacy.

LG That's right. And just at that… this would be 1932, and just at that time, the degree course in pharmacy had come out. It had been running, I think, for one year only then. Previously, to get into pharmacy, you had to do an apprenticeship. You did your first degree, first examination, then you did an apprenticeship, and then you were allowed to do your C and D – chemist and druggist - or pharmaceutical chemist examination. But they'd just brought in the degree course, the B Pharm course, and so my uncle suggested I went to see Hugh Linstead, who was then the secretary of the Pharmaceutical Society, in Bloomsbury Square, where the College was. And so I saw Hugh…

MB What was the College actually called, Len?

LG It was called the College of the Pharmaceutical Society.

MB Right.

LG Everybody referred to it as 'The Square' – Bloomsbury Square. And Linstead was the Secretary [of the Pharmaceutical Society]. He became a very good friend of mine. Because, at the beginning, you see, he said, 'Well,' he said, 'with what you've got, what you need is some biology, and then you can go into the degree course.' So I said, 'Oh well, yes.' He said, 'But you must do a bit of pharmacy in between. We can fix up for you to do botany and zoology at University College, but you must get some information on pharmacy in between, in your spare time, and you can come here, perhaps. Go up and see Professor [H G] Greenish.' Professor Greenish was then the dean, and he was the great pharmacognosist – the science of drugs, you know, natural drugs: barks and extracts and things of plant materials. And he was a funny old man, with long, drooping moustaches, you see. And I went up to see him, and he said, 'It would be quite impossible.' So I went back to see Linstead, who was in the same building – the Society had its own offices in the same building – and he said, 'Oh, does he! I'll go and see him,' he said. So he slipped straight upstairs to see Greenish, and ten minutes later he came back and said, 'That's all right. It's all organised.' And so I started off going about a couple of days a week, to do botany and zoology in University College.

MB What was that like? Some good teachers?

LG Oh yes. There was… [F E] Fritch and [E J] Salisbury were both there. Professor Salisbury was my professor there, and… I've forgotten the zoology men. But, anyway, that was quite good, in those days.

MB And was Solly Zuckerman teaching there around that time? Did you come across him?

LG Solly, I saw later. He came in… it was 1935ish, he was there.

MB A little bit later he moved in. But he made an impact.

LG Oh, he certainly made an impact. That was when I was doing physiology.

MB Oh, right. So we'll come to him in due course.

LG Yes.

MB So that, that kind of inter year, you really moved ahead, and got the biological background.

LG That's right. And then, in 1933, I started on the degree course, you see, for the pharmacy course. That's two years. And I qualified in 1935.

MB What kind of a pharmacy course was that? I mean, was it impressive, or was it standard basic drugs and…

LG Oh, it was very good. No, no, it was very good. The chemistry was run by Wilfred Linnell, W H Linnell, who was a great big tall chap, with a bald head. And he was very forceful. And there was… the practical chap was Barradaile Whiddon Melhuish, who was a great force, a forceful character. What we used to have to do was to, in chemistry, was to be given a sample to assay for alkaloids, or whatever it was, and you had to get within the right limits with your answer, otherwise you did it all over again. And in the pharmacy course, you had a dispensing schedule, which was usually a pill, a mixture, some kind of powder or something to make up: some of them very difficult, some very easy, and you had to organise your schedule so that it was… everything was finished at the right time at the end, you see.

MB So it was a pretty precise regime.

LG Oh yes. Some things used to take quite a long time. It taught you quite good housekeeping as to how to do things. And, of course, the physiology… it was called physiology then, but it was really pharmacology – the action of drugs on the body. And that was run by Professor Burn, J H Burn.

MB Who became quite important later on.

LG Oh yes, he became a big influence, yes, for sure.

MB Was he an impressive physiologist, pharmacologist?

LG Oh yes! He had quite a history. He, in fact, had worked at Wellcome also, with [Henry] Dale, and he worked with Dale in the National Institute for Medical Research at Hampstead as well, at one time, before he became director of what was called the Laboratory of Physiology[1] in the Square, at the Pharmacy School, which not only did pharmacology, but it also did vitamin essays. There was Katherine Coward, the vitamin queen, who did vitamin assays there at the same time.

MB It was an interesting place to be.

LG It was. Very interesting.

MB And your science kind of interest obviously grew with that, because they were really giving you opportunities.

LG Oh yes. Yes. That's right.

MB In a way, you were doing small kind of research challenge projects.

LG No, I… you mean…?

MB I mean the exercises they gave you in the course.

LG Oh yes, sure. You had to organise yourself, yes.

MB Stretching you, and moving you on.

LG Yes. Yes. I think it was a very good course.

MB It's interesting to have a background because it was only one year old, as you were saying.

LG Yes. And the… no, this is a two-year course.

MB No, I mean the course had just been started one year, I think, before you got there then.

LG Yes, sure. Ah, but the course was also based on the pharmaceutical chemist examination, you see, of the Society, which ran the same students, the same course for the same group of students, some doing the degree, some doing the Society.

MB So that's put in place fairly well.

LG Yes. And the pharmacognosy was run by a lovely man called Tommy Wallis, T E Wallis, who used to tell you all about drugs. I used to imitate him at parties, and so on.

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[1] Dr Goodwin has since pointed out that Henry Dale was director of the Physiological Research Laboratories.

MB He had mannerisms.

LG Oh, yes, yes.

MB Which we'll not go into now, but he was a fascinating character.

LG He was, yes. He was a dear old thing. Yes.

MB Burn, how quickly did Burn have an influence on you? I mean, you obviously met him in this teaching.

LG Almost at once. I mean, his lectures were… were very… quite exciting. I mean… 'Well, what do I mean by that? Well, what I mean by that is…' you see, and he used to go off and…

MB Spirited.

LG Yes, spirited lecturer, and very interesting. And that was all right. And then when I qualified, I was offered a demonstratorship in pharmacy, which meant I had to teach.

MB This was '34/'35ish?

LG It was '35. '35, '36. And that's when Burn took me over.

MB Yes, he did.

LG Because he said, 'You're going to do…' You got a demonstratorship in a section in which there was a vacancy, you see. If there was a vacancy in something, and you were offered one, you had to take that. And it happened to be in pharmacy, and I did pharmacy demonstrating. But, at the same time, I was expected to do something else useful, you see. And so Burn said, 'Well, you must learn some physiology. You go back to University College and do physiology.' So I did that, you see.

MB So you enrolled for a BSc in physiology?

LG Yes, I was inclined to do what Burn told me, you see.

MB This was another lot of fees. This was quite an expensive thing.

LG Oh well, I had to pay that. But I was living at home at the time, and I was getting £165 a year, at the time, as a demonstrator, and I paid part of that for my keep at home, and had enough to pay… the fees were not very high in those days, of course.

MB Burn was pushing you.

LG Yes.

MB Obviously saw a little way down the track.

LG Well, I suppose he did, yes.

MB What did he have in mind for you, at the end of the day?

LG He wanted me to be a doctor, I think, in the end, because when I'd done the physiology, he said, 'Right, now you've got to do your second MB', he said. And he sent me back to UC to do… what was it that I lacked in those days?

(Marie Goodwin Anatomy.)

LG Anatomy.

MB Thanks Marie. I should just say that Len's wife, Marie, is sitting with us, and it's a great pleasure Marie, to have you joining us.

LG Anatomy and pharmacology, which was… which I knew about, but had not been examined in, you see.

MB Did he do that with many people? Did he have many people he sponsored in that way?

LG He used to press lots of people to do things, but I don't think anybody who worked with Burn, was left…

MB Left untouched.

LG No.

MB They'd got to move in one direction or another.

LG We had a very good team there. I mean, there was… there was Edith Bülbring. Bülbring and Burn were very famous people for working on sympathomimetic compounds. And a number of other people – L C Kassner, Hilda Bruce, Hans Lindholm, and George Brownlee, who we may see later, and a number of others. Lots and lots of visitors from overseas he had, working in the lab. They were quite famous.

MB You really were surrounded by a range of influences.

LG Oh yes. They were good. There were very good people.

MB And when you were at University College doing the courses that you were pushed to complete by Burn, were there lecturers who made impact?

LG Oh, sure. Oh, sure. There were lots and lots of… we had lots of good people.

MB And you mentioned Solly.

LG Solly, yes. Well, Solly…

MB What was he…?

LG Well, Solly was a… Solly had come over from South Africa, and had done a lot of work on his baboons, you see. And one session, we…[A V] Hill, who was our… the professor, used to let lots of his research students and so on, give lectures, you see. And he encouraged them to give lectures to students. And one day, this small, dark, gentleman from South Africa, came in and gave a course about baboons and their sexual habits and behaviours and things, which sounded completely out of this world – you know, unbelievable stuff. He danced about, and sort of waved his arms and so on. He was practically incoherent at the time. And that was Solly, the first time I saw him. Of course, none of us knew how important all this was, at the time.

MB So you didn't go away feeling 'That, I'll really put down as a special lecture'?

LG Oh no!

MB That was put down as entertainment!

LG Entertainment, yes.

MB We're going to move you on, because that second MB… anybody in the second MB stage?

LG Oh dear, I can't remember them. What, the people, you mean?

MB Yes, just people who influenced you in that course.

LG Well, I don't know about influence, particularly. I had some quite interesting colleagues. I mean, there was R E O Williams,[2] who became a professor of physiology, he was my classmate. And Peter Quilliam,[3] who became… I don't know, he became chief (?) in the Senate in the University… Senate House, he lived in for a time. But I haven't prepared this list for you, so I don't remember who they all were.

MB You're ticking these people off very well, actually.

LG Quite a lot of people.

MB But you had many colleagues around you, and you still kept on building friendships. I know that many of them have lasted…

LG Quite a long time.

MB …over the years.

LG Yes, yes. Yes.

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[2] Sir Robert Evan Owen Williams.

[3] Professor J.P. Quilliam. Professor of pharmacology, University of London, at St Bartholomew's Hospital Medical College, 1962-83. Chairman of Convocation of the University of London, 1973-90.

MB When you get second MB, you're moving through the Thirties, you're becoming quite a qualified individual. Where was the view of the future for you? You said that Burn thought you might do medicine, but I don't see that that was your view.

LG Well, it was interrupted, of course, by the war, or the threat of war, in 1938 and '39. And by 1939, I was earning then £250 a year, I think, by then, and I'd been a student of University College for, in fact, about ten years, something like... seven, seven or eight years, anyway. And Burn, himself, had gone to Oxford, as a professor, and my professor then was [John Henry] Gaddum. And Gaddum was going to Edinburgh, and very soon, of course, he was whipped up into the war machine. The Pharmacy School was evacuated to Cardiff, and before that happened, I thought that I ought to move on a bit, because I thought I should probably have to go into the army, but, in any case, I wasn't going down to Cardiff, because I...

MB It seemed to be a tremendous melting-pot time, didn't it.

LG Oh, it was, yes. So I thought I'd better, you know, try and find something else. So I went to my uncle and he said, 'You'd better go and see Dr [C M] Wenyon[4] at the Wellcome.' And you know the story of my meeting with Wenyon?

MB I want to hear it.

LG You do? Well, Wenyon was in the new building of the Wellcome Foundation, which Sir Henry Wellcome had built in Euston Road.

MB Just near the station.

LG In 1932. And I had actually seen it being built when I was going to University College.

MB Well, that was a whacking building, that must have taken some time to...

LG Oh yes. No, it didn't, it only took a year and a half, or something. It was a very short time. They... they demolished Endsleigh Gardens, and built it all up then, in a very short time. And Wellcome himself died in 1936, but he had established his units there, his centre. He had turned the... he had turned the company, Burroughs Wellcome Company, into the Wellcome Foundation, which covered all his laboratories and his chemical works, and all the institutions like the libraries and museums and so on, were all the Foundation which he left to himself. And when he died, these all went into the hands of the Wellcome Trust, as shareholders of the company, you see. Anyway, that was... that building was there.

MB So we're thinking of a massive empire...

LG Yes.

MB ...with lots of ramifications, and held in trust by a few, a few distinguished, kind of entrepreneurs.

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[4] Charles Morley Wenyon CMG (1878-1948). Director-in-chief of the Wellcome Research Institution until 1944.

LG That's right. And the director in chief of the whole of the laboratory, the director in chief of the science side, was Wenyon, C M Wenyon, protozoologist.

MB So he was now an administrator, virtually. But had he got a distinguished scientific background?

LG Oh yes. He was the protozoologist. I mean, he had written a great... well, tome, two volume work on protozoology.[5] He had been a member of Wellcome's group in the Sudan, and he was on the boats up and down the Nile, and he was there. And he, afterwards, became director, after [Andrew] Balfour had gone to the London School [of Hygiene and Tropical Medicine]. And he was the chap I went to see, right.

MB That classical interview that...

LG That's right.

MB Which you're going to tell us about, Len.

LG Well, I made an appointment, I went up to see him in his office, and he asked me a few questions, and then he handed me a piece of paper with something in German on it, you see. And he said, 'What's that all about, uh?' And so I said, 'Well, it's about trivalent and pentavalent antimony,' which I could read, 'on some disease I know nothing about.' So he said, 'Did you know that, or did you guess it?' I said, 'I guessed it.' So he said, 'Hmm! That's how I read German, what!' And he asked me a few more things, and said, 'Come and see me in a week,' you see. So I went back in a week and he then said, 'I've been down to see Gaddum and he doesn't particularly want to get rid of you. I think I can find something for you to do,' he said.

MB So he'd taken time out and gone and interviewed the people...

LG He'd been... had gone and interviewed my professor, yes, to see whether I was any good, I suppose.

MB It would also suggest, from the grunts you made at the end of the sentences, that he had a...

LG Oh, he... he had.

MB ...an inimitable style of finishing sentences!

LG Yes, he did, yes. Well, he had a very, very close hand on what happened. Very little escaped him. He was born in China. His father was a medical missionary, and he had sort of... rather hanging down lids, and slight slanty eyes that, you know, he must have acquired by looking at Chinese, I suppose. And he had, certainly, a lot of style. He'd been on this Khartoum job. Through the war, the First World War, he had been part of a circus, Balfour's travelling circus, which advised on tropical medicine in all areas of the Forces where action was taking place, particularly in the Middle East. He

[5] Wenyon, C.M., 1926. *Protozoology: a manual for medical men, veterinarians and zoologists.* London: Baillière, Tindall and Cox.

was an expert on amoebiasis, particularly in its treatment and so on. He was a very experienced character. Very little escaped him, and…

MB So he had the right background for the job.

LG Oh yes. He was a great… he knew a great deal. And the old man made him… old Wellcome made him do a great deal. I mean, the idea that Wellcome scientists were allowed to sit down and do exactly as they pleased, academically, is true. But it also carried a great labour, because when you're… you know, having looked at a lot of old papers recently, to write that thing I gave you, it's quite clear that he received something like half a dozen letters a week from [the] Wellcome [Company], asking all kinds of things, such as how to receive and entertain a visiting potentate, how to draft a certain advertisement, what diseases took place in Seringapatam, and, you know, all kinds of things that he had to answer. He also had to chair a joint research committee meeting, and report on it. And every month he wrote a report to Wellcome, himself. And these are all annotated in Wellcome's own handwriting, as to various things… you know, various comments: 'too expensive', you know, 'question mark'.

MB So Wellcome very much had his hand on the tiller?

LG Oh yes.

MB Right through towards the end of his life.

LG Oh yes. Certainly.

MB Was there a kind of a residue of that? Were the people around you, when you arrived… surely you arrived there, because you were chosen, given a job to do there, by Wenyon. When you arrived, did people still talk of Wellcome?

LG Oh yes. Certainly his spirit was still there, very much.

MB But he walked the corridors there?

LG Yes. The building was interesting in its structure. He had built it in order to exhibit his collections, which were vast, of course… far, far more than he could hold. His library was on the third floor, I think it was. On the second floor, one section was a street of pharmacies – beautiful they were. They were complete pharmacies. You could walk in. They had shelves, they had all the pots and equipment, and drug jars and bottles. There was an Italian one, absolutely covered with Italian drug jars, each one, you know, a perfect piece.

MB They were really great facsimiles?

LG No, no, real.

MB They'd just been lifted and put there?

LG Yes. Real. Yes, lifted and put there. There was the whole of Jacob Bell's pharmacy was there. He was the patriarch of the Pharmaceutical Society, and his shop

in London had been bought up by Wellcome, and been transplanted there, complete with bottles and equipment, and everything was there. And there was a Hispano Moresque, there was an Arab pharmacy, there was an Indian pharmacy, there was a whole street full of…

MB Len, what happened to these places?

LG Oh, they were all packed up. They were never really open to the public.

MB But where are they now?

LG Oh, I don't know, dispersed completely. I don't know.

MB That's tragic.

LG Yes, it is rather. But, you see, nobody can keep anything like that going anymore. There was a museum of medical science on the ground floor, also, which has now also gone. And up on the fourth and the fifth floors… sorry, the fourth floor, the … yes, yes, fourth and fifth floors, there was the Wellcome Bureau of Scientific Research. Now, this was the successor to his Khartoum laboratories – he had, established his tropical, Wellcome Tropical Research Labs in Khartoum – that came back to London in 1913, with Andrew Balfour. And it was centred on tropical medicine, because Wellcome was interested in the tropics. He was interested in alleviating the illnesses of tropical people; he was interested in plants and the drugs that they produced, and, of course, he made lots of remedies for tropical diseases. I mean, emetine, and things of that kind for amoebiasis; quinine, and cinchona alkaloids for treating various forms of malaria. He had quite a load of tropical things. In fact, he published little booklets called 'Excerpta Medica', which had a section on tropical medicine. And he maintained this interest. And up there, there was Wenyon, and there was Cecil Hoare, who was an expert on trypanosomiasis. There was a chap called [J C] Broom, who was working on leptospirosis, and he eventually had the world sort of reference laboratory for leptospires. There was a man called [John] Woodland, who was a helminthologist, he didn't… he used to collect large quantities of the material from the zoo every week, and examine it for worms and so on, and report back to the zoo. It was a constant sort of source of material. And, of course, connections were world-wide for the Bureau.

MB A great network.

LG Oh yes. They were well known. So if the company produced anything of interest by way of a medicine, it could always be tested by one of Wenyon's, or somebody else's pals out in the tropics, you see. Always.

MB Fascinating that Wellcome had produced such a…

LG Oh yes.

MB …powerful centre to world tropical medicine.

LG That's right. And nobody else was really interested in this. And, I mean, there was the… it grew, really, out of [Patrick] Manson's Tropical Medical… School of Tropical Medicine, which was in the Albert Dock [Branch Hospital] for a long time, and later came to Gower Street, you know.

MB I was going to ask about this, because, obviously, that corner, down the Euston Road, almost diagonally across from the station side, why was that chosen? Was it chosen because it was near the School of Tropical Medicine?

LG No, the School came after Wellcome.

MB The School came after Wellcome?

LG Yes. Wellcome first had his place in Endsleigh Gardens, as it was then, and… which was in 1913, you see. The School came after that to Gower Street.

MB So Wellcome really was the leading figure. He was the basic pioneer.

LG His… the people who ran his departments were out of Manson's School, you see, out of the Tropical…

MB They hadn't come together as Tropical Medicine and Hygiene at that stage, that you were saying was…

LG The Hygiene came later, with the American grant.

MB From Rockefeller.

LG Rockefeller, yes. For the… for the building of the School, you see.

MB And you arrived there, '39. I don't think it was long after that that you actually got a call-up?

LG That's right, yes. I was called up to the Tank Corps, and I was in Aldershot, I think it was, for a couple of days, and they fished me out again, because we were actually making…

MB Wenyon fished you out?

LG Yes, apparently. I don't know, somebody did. Because we were making, at the time, medicines for treating people, troops in the tropics.

MB You must have been terribly disappointed to miss out on the Tank Corps.

LG I was, yes!

MB It must have been terrible for you. And you came back to Euston Road?

LG I came back to Euston Road, yes.

MB What actual department... we've talked about one or two, but what actual department were you in? Physiology?

LG No, I was in the lab next to... next to Cecil Hoare. I mean, Wenyon said, 'He'll tell you something about parasites, about protozoa,' you see. And he told me all about trypanosomes, and about... and about amoebae, and leishmanias and things of that kind. Wenyon was particularly interested in the leishmanias, because his own interest was in the cutaneous leishmaniasis. Leishmaniasis is caused by a small protozoal parasite which lives actually in the cells which normally mop up parasites, the macrophages, transmitted by sandflies. And there are various kinds. There is the one on the skin, which causes tropical ulcer - Delhi boil, Baghdad button, it has a lot of other names. And then there's the visceral one, which attacks the liver and the spleen and elsewhere, inside, which is *Leishmania donovani*, or *infantum,* in the Mediterranean. And, at the time, there were quite a lot of American troops in Sicily, who were getting cases during the war, Second World War. And Wellcome had already manufactured and sold the compound, an antimony compound, called Neostam, which was made by a fellow called [W H] Gray, who was in the chemical laboratories, who were on the same floor as us, on the fourth floor. And Wenyon was interested in the thing, because he inoculated himself for *Leishmania* on the skin, in order to find out what happened in the life history of the parasites, you see. He made a joke of it, because one day, when he'd been studying this for a long time, and it was getting to the point which was rather important, he cut it off with a tennis racquet during a tennis match, you see. And he said, 'I lost it, completely!' you see. But he was interested in leishmaniasis as a subject, and its treatment, and he'd been following closely the German work, which he showed me on a piece of paper, which related to a compound called Solustibosan, which I G Farben had made, which was different from the normal kinds which Wellcome made, in that the antimony atom was joined to carbon through an oxygen atom, instead of direct. So it wasn't a phenylstibonic acid derivative, it was rather like tartar emetic in structure, but pentavalent. And this was supposed to be more effective and less toxic, and it had quite extensive clinical trials. So the idea was to make some, you see, make some to replace it, because we were all busy replacing German drugs at the time.

MB And that was a great theme of the time, wasn't it.

LG The time... yes, to replace things which you couldn't get from overseas anymore.

MB And I think you said that the pharmaceutical industry at that time, Len, collaborated in a way that it had probably never done at any other time.

LG Absolutely. It did, a little later. It took a little while. It was called the... I'll tell you in a minute.

MB It was some kind of collaborating committee, wasn't it?

LG It was, yes. Yes.

MB And you all shared notes.

LG We all shared notes. We were very... well, we used to... we used to meet at scientific meetings and exchange quite a lot of information, because, you know, we were all interested in the thing. And the areas of research were shared out between the companies, quite a bit, so that, you know, one company worked on analgesics if they were up in those, and one company worked on other kinds of things, and we were doing the tropical stuff, you see.

MB Also seen to be a logical part of the war effort.

LG It was, yes, it was. I'm trying to remember the names...[6]

MB It'll come to you.

LG It doesn't matter.

MB We'll not push it at this time. But we've got the message that that collaboration was going.

LG Collaboration.

MB Len, at that particular point, I'm just going to hold a halt to that getting into leishmaniasis, getting into testing materials at trials level. I'm going to actually stop, because we've got you with a career, raging ahead, but we haven't got you to a point of courtship, or a relationship. And I know that you were going to have a marriage in about 1940, a marriage that was to have an important life-long support for you.

LG Yes, well, I met Marie, of course, when she was a student at The Square, at the same time as... the year after, a couple of years after me, and...

MB What year was that? '37?

LG It would be '35. '35, yes, when I had qualified, and she hadn't.

(Marie Goodwin '37.)

LG All right, '37, if that's what she says!

MB I got one right, Len! Marie thanks again. And you met this young lady.

LG Yes, that's right.

MB And how did you actually meet? Was it through the labs, or...

LG Oh, no, no, we used to have all kinds of get-togethers in the... I mean, staff and students used to do all sorts of things. We used to have rambles at weekends – Sundays we would ramble. The staff used to do rambles; Burn used to have the dean's ramble and the students used to come, and we used to go out to a place like... you know, on the Chilterns or somewhere, and have a day and lunch in a pub and so on.

[6] Dr Goodwin has since provided the following names: The Therapeutic Research Corporation – Wellcome, BDH, May & Baker, Glaxo, and Allen & Hanburys.

MB You had a good social life.

LG Oh yes, we used to do that regularly. And then in the Easter times, Frankie Wokes, who was a member of the staff of the of the physiological labs, and a vitamin chap, had a cousin who lived in Ambleside, up in the Lake District, and so usually a group of about a dozen to twenty of us, would sign on and go to the Lakes, stay at her guest house at Ambleside, and walk over the Lakes, because he was a great walker, he knew all the ways everywhere, up Helvellyn and Scafell and so on. So that used to happen, he used to have a Lakes party, and so on. There was plenty of opportunity for staff and students to get together in those days.

MB And this particular one caught your eye.

LG Yes.

MB In a particular way.

LG Yes.

MB And when did you start walking out, almost straightaway?

LG Well, I don't know what you call 'walking out'!

MB Ask Marie!

LG Well, it was different in those days, you know. I was invited to go home to tea one day, and then we got…

MB We'd better put her family name on the map as well.

LG Oh yes, Marie Coates, yes. And I used to go… she was a great horse rider at the time, so I had to go and join in and do some horse riding at weekends sometimes.

MB Down at her folk's place?

LG Well, they lived in Wanstead, and we used to go in Epping Forest usually.

MB And that was to lead to marriage in 1940.

LG 1940, that's right, when she was working for Glaxo. Glaxo, Glaxo-Wellcome, you see! But even then, you see, the collaboration was quite close, because in 1943 I wrote a paper with a member of the Glaxo staff.[7,8] There was a chap called Jimmy Page there, who had a new piece of equipment, called a polarograph, which would measure antimony, trivalent and pentavalent antimony, separately, and I couldn't do that. So I made an arrangement with him so that samples from my mice, and samples from me, who'd had injections, and my colleagues who'd had injections of the stuff we were

[7] Goodwin, L.G. and Page, J.E. (1943). A study of the excretion of organic antimonials using a polarographic procedure. Biochem. J. *37*, 198.
[8] Goodwin, L.G. and Page, J.E. (1943). A note on the fate of stibophen in the body. Biochem. J. *37*, 482.

working with, went home and out to Glaxo, were assayed in Glaxo, the results came back again, and Jimmy Page and I wrote a paper in 1943 – one from Wellcome, one from Glaxo. You couldn't do that now, could you?

MB 1943 was a vintage year for papers. I know you did one on, I think on the pancreas as well?

LG No, no, the spleen.[9]

MB On the spleen, yes.

LG Yes.

MB That was quite a nice test. But let's keep to the earliest part of the Forties, because I want to really go through, serially, if I can, that work that you did on leishmaniasis. How did that actually take off, Len? What was the first foothill step?

LG What took off was the fact that I had been trained by Burn to assay compounds, to measure biological activity fairly accurately, you see. And in those days, in chemotherapy, the measurement they used was a thing called the chemotherapeutic index, which was the maximum tolerated... no, the maximum tolerated dose over the minimum effective dose, you see. Now, that meant that something might kill you or something, and might... might cure something. But it had no real sort of limits of error to it, and it could be very widely interpreted. And I thought, you know, that this wasn't good enough, so I tried to measure things with limits of error to it. And it was necessary in order to find out whether any of the compounds which were being made by Wellcome were better than each other, and you needed some kind of assay for this. And so I did quite a lot of work for finding out how to measure leishmanicidal activity, the killing activity of a drug on this parasite. And that was... the Germans, in their work had used hamsters, European hamsters, which are rather resistant to the parasite. They don't take it very easily, and the treatment used to take about six months, so that, you know, it used to take six months to find an answer, which was nowhere near good enough for me, at the time, because I had a load of compounds which the chemist had made, to compare. And so the spleen of the hamster, and this time, of the Syrian hamsters which we had – and there are some stories about those – the spleen was a thing which you could get a sample of, if you made a little snick and pulled it out and took a piece off the end, and could make dabs on a slide and then examine it and count the numbers of parasites to the number of nuclei, the split cell nuclei. And that gave you a ratio, which would give you the idea as to how heavy the infection was, and if it was reduced what the reduction was. So, after treatment, you did another sample, and found out how, you know, if it had changed. Ordinarily, if you left a control animal, it would have greatly increased, but if you treat it, then it decreases, you see, and depending on how much it decreases, is the effect. You get a dose-response curve.

MB A good, infective assay.

LG Yes. It worked all right.

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[9] Goodwin, L.G. (1944). The chemotherapy of experimental leishmaniasis I. The spleen as an index of infection in the Syrian hamster. Trans. R. Soc. trop. Med. Hyg. *38*, 151.

MB And that's the one I mentioned you published in '43.

LG Was it '43? About then, yes.

MB An important paper.

LG Mmm. Yes.

MB And the hamsters we're talking about, they took the trypanosomes and...

LG No, they'd take the leishmania parasites.

MB They'd take the parasites.

LG Yes. They came, they came from Saul Adler, who's an old pal of ours. He was a pal of Wenyon's, actually, he was a Leeds graduate, but he was an Israeli, and he'd worked in Jerusalem, and he used to come in, chain smoking, fag on the bottom of his lip all the time. But he was a wonderful man. And he got one litter of hamsters out of a burrow in Aleppo [Syria], and managed to get them to breed in the lab, and he brought them over and gave a couple of pairs to Edward Hindle, who was then working at the Bureau, to start the colony in England. And from those, that group, all of the hamsters which you see in Europe have come. I mean, they were the original ones which Hindle had from Adler, which was the start of all the hamster colonies everywhere.

MB I have heard that. That's the true story, is it?

LG Yes, that's the true story, yes.

MB And, as you said, those hamsters proved particularly significant in research.

LG They were very, very useful, yes. I was given what Hindle had left, you see, and it was a most peculiar system he had. He bred them in biscuit tins, and... biscuit tins full of hay, so that whenever you took the lid off and put your hand in, a hamster came up and bit it, you see, like this, they were very angry creatures. They were also fed on oats mixed with Marmite and cod liver oil, which was rather weird, and I changed all this; I got them into decent cages and fed them on a decent diet, and they bred much better, and they were not so... not so angry, in those days. And they worked very well as animals for leishmaniasis. There are strains of *Leishmania* now which will go into mice as well, but in those days, there was only one or two, and we used to get our own strains. In fact, I got strains from servicemen in Sicily and so on, to grow up and use for the... for the tests. And our first samples of Pentostam, which was the material which we made to... you know, to replace the German material, were tried out...

MB That came out from your trials?

LG That came out from our work, we made...

MB These many materials.

LG Yes, the chemists made a whole series of compounds of the same… A chap called Bill Solomon made these, and they were a whole series of compounds of this type.

MB Was he a close colleague?

LG Oh yes, he was a… he was one of the chemists across the… across the way.

MB I've heard of him. What kind of a guy was he?

LG A rather quiet, quiet sort of fellow.

MB Just meticulous, getting on with churning these things out.

LG Yes. He was… yes. No, not quite like that! The chemists rather resented the wartime effort, actually. They thought of themselves as being a bit purer than that. I mean, they liked to analyse the structures of plant alkaloids. Their boss was T A Henry,[10] who was a plant alkaloid chemist. He wrote the great book on the plant alkaloids. And Solomon was originally working on cinchona alkaloids, and he was bound up in the structures of cinchonine, cinchonidine, and quinidine, and so on, but he was put to make these antimony compounds.

MB So that was a kind of pretty… from their point of view, a pretty unfortunate digression from their main….

LG A little bit.

MB …ethereal kind of atmosphere.

LG Just a little. But he was a very good chemist. He made a lot, and I tested a lot. I mean, you could sort of chuck some of them out quite quickly because they were too poisonous to mice, you see, and you couldn't… and then you selected the less toxic ones, and tried those to see how effective they were on the parasites.

MB But you were saying, you came up, sooner or later, within a year or so, with…

LG With a good one, yes, which was sold as Pentostam, and we tried it first of all on some of these American service chaps in Sicily, because, as far as I could see, it had the same characteristics as the German material. It wasn't any more poisonous. The German material had been used. You didn't have, in those days, have to go through F&DA [Food and Drug Administration] or anything of that kind, or get it registered.

MB Yes, it was a different time, wasn't it.

LG Absolutely different, yes.

MB So you could get things out on the market quite quickly.

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[10] Henry, T.A., 1913. *The plant alkaloids*. London: Churchill.

LG Well…

MB Toxicity tests were low?

LG Well, you could get them used, that was really the main thing. I mean, we were interested in curing these chaps, and giving them something they could use in the field and…

MB But you were getting feedback from the field?

LG Oh yes, all the time.

MB You weren't just indiscriminately pushing it on.

LG Oh yes, all the time, yes.

MB Who ran that end of the business?

LG Well, we did. Wenyon did, in fact, at the time, you see. I mean, he had pals in the American Army, in the American Forces, who came with their problems, and they used to come and see…

MB So you were dispatching it to Sicily and getting information back.

LG That's right, yes. It was quite different.

MB Entirely different time.

LG Yes.

MB It's fascinating to have that picture of it, though.

LG Well, people… people, in those days, were not so keen to take you to court if they thought anything had happened, you see. Lawyers were not in the picture in those days.

MB When you mentioned your early link and direction from Wenyon, it was to get to know something about protozoa, and become a protozoologist, in a way. How…

LG No, no, no. He wanted me to be… he wanted to do the chemotherapy.

MB Oh, it was the chemotherapy aspect.

LG Yes. Yes.

MB What did you turn to when you'd got the first trials with products going out into the field? What did you turn to next?

LG Well, you see, events sort of took over rather, because when Wenyon retired in 1943, another R D, you see, '43, [J C] Broom was the sort of caretaker director, and then Charles Kellaway was appointed.

MB Just staying with Broom, though, tell me a little bit about Broom. He was there just a short time at the helm?

LG Oh no… a short time at the helm, yes. He was a very quiet Scotsman who was interested in leptospires and not a lot else. He used to work with a chap called Brown, H C Brown, who was a bacteriologist, and they were interested in the electric charges on bacteria - a rather strange thing, which never came to anything, but, you know, was quite fascinating. It might have something important to it, but it didn't ever…

MB And they slaved over that for…

LG Oh, quite a long time, yes. The bacteria sort of moved under an electric current, in different ways, and they thought they might have some way of influencing their lives. But the chemotherapy, you see, was… in the lab, the chap in charge of chemotherapy was… his name's gone, sorry! *Recent Advances in Chemotherapy* – G M Findlay, and he wrote the *Recent Advances* book,[11] and he was in charge. He was mostly overseas, though, working with the Forces. He was a colonel in the RAMC for the purpose of the war, and so he was mostly out of the way. But I stayed doing the work in the lab. And when Kellaway came, as the research director, director in chief, he appointed John Boyd to be Director of the Laboratories, which he changed from Bureau of Scientific Research to Laboratories of Tropical Medicine, Wellcome – WLTM, and I was put in charge of the chemotherapy screening programme, which he organised. You see, when Kellaway came, the Foundation had a lot of separate units, all doing their own research things, not being co-ordinated at all to make, you know, any definite effort towards increasing the prosperity of the company.

MB This was kind of academic groups…

LG More or less, yes.

MB …spread around, doing their thing.

LG Yes. And the company was not doing too well at the time, and you could hear more of that from George Brownlee, who knows a lot about that, more about that than I do. But when Kellaway… Kellaway reorganised everything, but he kept Tropical Medicine, for some reason or other. He was an Australian who was interested in, and made his name on working on toxicology of snakebites, and snake venoms. And he put me in charge of the chemotherapy of the… of the tropical side, you see, so that there was my protozoal bit, and there was Owen Standen doing helminthology as well, and we were working together, under John Boyd, as the people who were looking for new drugs for these diseases.

MB You were, essentially, the two tropical teams.

[11] Findlay, G.M., 1930. *Recent Advances in Chemotherapy*. London: J&A Churchill.

LG Yes. So Standen had the schistosomes and the roundworms and the threadworms and the tapeworms, and all those things, and I had the trypanosomes and the leishmanias and the amoebae, and a number of other things.

MB I mentioned the… the named team. What kind of a team did you have to start with there?

LG Starting with the Bureau, I think you… I told you who was there in the Bureau time. The team was… the teamwork was practically nil at that time, as a team.

MB But when you came to have this team.

LG At the beginning…

MB When Kellaway came.

LG When Kellaway came? Oh, I had… about four, four people, I think. I had Marjorie Goss, who was doing trypanosomes, and John Locke came, later Ian Rollo, Betty Beveridge, and a group of technicians. I suppose I had about ten people altogether in the Protozoology Section. Owen Standen had rather less. But there were a number of other things going on, there was the yellow fever, and so on. I think we've done enough, haven't we?

MB Yes, you have. Okay. Thank you for this afternoon. Thank you.